

What is claimed is:

1. A modulator comprising:
 - a) a transformer comprising a primary and a plurality of secondary windings, each secondary winding having an output terminal; and
 - 5 b) a plurality of switches, each switch associated with a respective secondary winding and having input and output terminals and a control terminal, the control terminal of each switch being in electrical communication with a respective output terminal of the plurality of secondary windings,
10 wherein the plurality of switches are substantially simultaneously switched by an input signal applied to the primary.
2. The modulator of claim 1 wherein the transformer further comprises a toroidal core.
3. The modulator of claim 1 wherein a length of wire forming each of the plurality of secondary windings is substantially the same, wherein each of the plurality of switches turns off and on at substantially the same time.
- 15 4. The modulator of claim 1 wherein the transformer further comprises a ferrite core.
5. The modulator of claim 1 further comprising at least one voltage limiter in parallel with at least one of the switches.
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6. The modulator of claim 5 wherein the voltage limiter comprises a Zener device.
7. The modulator of claim 5 wherein the voltage limiter further comprises a snubbing circuit.
8. The modulator of claim 5 wherein the voltage limiter comprises a metal oxide varistor.

9. The modulator of claim 5 wherein the at least one voltage limiter is connected across the input and output terminals of at least one of the plurality of switches.

10. The modulator of claim 1 wherein the plurality of switches are connected in parallel.

11. The modulator of claim 1 wherein the plurality of switches are connected in series.

5 12. The modulator of claim 1 wherein the plurality of switches are connected in a series/parallel combination.

13. The modulator of claim 1 wherein at least one of the plurality of switches comprises an avalanche-rated field effect transistor.

14. The modulator of claim 1 wherein at least one of the plurality of switches comprises an insulated gate bipolar transistor.

10 15. The modulator of claim 1 further comprising a logic gate circuit in electrical communication with an input terminal of the primary winding.

16. The modulator of claim 1 wherein the primary winding further comprises an output terminal at ground potential.

15 17. The modulator of claim 1 wherein the primary winding comprises a distributed primary winding.

18. The modulator of claim 1 wherein the primary winding comprises a plurality of windings connected in parallel.

19. A modulator comprising:

20 a) a transformer comprising a primary and a plurality of secondary windings, each secondary winding having an output terminal;

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b) a plurality of retriggerable drive circuits, each of the retriggerable drive circuits being electrically connected with a respective one of the plurality of secondary windings and having an output; and

5 c) a plurality of switches, each switch associated with a respective retriggerable drive circuit and having two output terminals and a control terminal, the control terminal of each switch being in electrical communication with a respective output terminal of the retriggerable drive circuit,

10 wherein each of the plurality of switches is substantially simultaneously switched by a first signal applied to the primary and remains substantially on until a second signal is applied to the primary of the transformer.

20. The modulator of claim 19 wherein at least one of the first and second signals comprises a negative going signal.

21. The modulator of claim 19, wherein at least one of the first and second signals comprises a positive going signal.

15 22. The modulator of claim 19 wherein at least one of the first and second signals comprises a pulse.

23. The modulator of claim 19 wherein the first signal is different than the second signal.

24. The modulator of claim 19 wherein the transformer further comprises a toroidal core.

25. The modulator of claim 19 wherein the modulator comprises a stack of modulators sharing the primary of the transformer.

26. The modulator of claim 19 wherein each secondary winding of the transformer controls a respective plurality of switches.

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27. The modulator of claim 19 wherein at least one of the plurality of switches comprises an avalanche-rated field effect transistor.

28. The modulator of claim 19 wherein at least one of the plurality of switches comprises an insulated gate bipolar transistor.

5 29. The modulator of claim 19 wherein at least one of the plurality of retriggerable drive circuits comprises a Zener diode connected in series with a field effect transistor.

30. The modulator of claim 19 wherein at least one of the plurality of retriggerable drive circuits comprises a bipolar voltage limiting means.

31. A method of switching a signal, the method comprising the steps of:

10 a) applying an input signal to a primary of a transformer;

b) inducing a voltage in a plurality of secondary windings of the transformer in response to the input signal; and

c) switching, substantially simultaneously, each of a plurality of switches that are electrically controlled by a respective one of the plurality of secondary windings of the transformer, in response to the single input signal.

15 32. The method of claim 31, further comprising the step of maintaining each of the plurality of switches in a substantially conducting state after termination of the input signal.

20 33. The method of claim 31, further comprising the step of applying a reset input signal to the single primary winding of the transformer.

34. A modulator comprising:

a) a plurality of stacked transformers sharing the same primary, wherein the primary comprises at least one winding and each transformer further comprises

a plurality of secondary windings, each secondary winding having an output terminal;

5 b) a plurality of switches, each switch associated with a respective secondary winding and having input and output terminals and a control terminal, the control terminal of each switch being in electrical communication with a respective output terminal of the plurality of secondary windings,
wherein the plurality of switches are substantially simultaneously switched by an input signal applied to the primary.